2022 Ambient Air Monitoring Annual Network Plan and SO_2 Data Requirement Rule Annual Report

DRAFT May 3, 2022

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Division of Air Quality
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Promoting a healthy environment.

Executive Summary

The Annual Network Plan (ANP) provides information on each site within the West Virginia Department of Environmental Protection Division of Air Quality's (DAQ's) ambient air quality network. The requirement for this ANP was established by the United States Environmental Protection Agency (EPA) in 40 CFR Part 58.

Appendix A to this document provides DAQ's Sulfur Dioxide Data Requirements Rule (SO_2 DRR) Annual Report, including an emissions assessment, pursuant to the requirements of 40 CFR 51, Subpart BB, at §51.1205(b).

A public inspection and comment period is open for 30 days from the date this document is posted on our website.

A summary of air monitoring network changes and updates since the previous approval includes:

- **NCore** – DAQ again requests the special purpose continuous FEM $PM_{2.5}$, BAM, at the NCore site in Charleston be excluded from NAAQS determinations. We will continue to report to AirNow, as required for NCore sites; however, EPA's own comparison tool indicates that the data should not be used to replace or fill-in for FRM data. An annotated print-out of the results from EPA's FRM-FEM $PM_{2.5}$ Continuous Monitor Compatibility Assessment Tool for 2019-2021 data can be found in Appendix B. While dropping 2018 has improved the comparison, the continuous data continues to read higher than the Federal Reference Method (FRM).

- **Moundsville** – The continuous FEM $PM_{2.5}$ T640x remains a special monitor, and data is to be excluded from NAAQS determinations, since two complete years of data are not yet available.

- New Teledyne API T640x continuous PM_{10} monitors were installed at Summit Circle on 8/11/2021 and at Marland Heights on 10/6/2021 to replace aging TEOMs.

- **Warwood** - Toxics metals sampling frequency changed from once every 6 days to once every 12 days in April 2022.

- A new continuous FEM T640x monitor for $PM_{2.5}$ measurements is planned to be installed within the network during 2022.

- During EPA's Technical Systems Audit in July 2020, the observation was made that analyzers and calibration equipment should exhaust outside of all shelters. The following sites were upgraded to vent the monitors and calibrators outside in 2021 and early 2022: Lawrenceville, New Cumberland, Marland Heights, McKims Ridge, Warwood, Follansbee/Mahan Lane, Moundsville, and Summit Circle. Several remaining shelters are planned to be vented outside in 2022.

- Upgraded dataloggers with graphing capability will be installed at several sites around the state in 2022.

Purpose

The Annual Network Plan (ANP) provides information on each site within the West Virginia Department of Environmental Protection Division of Air Quality's (DAQ's) ambient air quality network. If necessary, the ANP includes documentation of any changes to the state's $PM_{2.5}$ monitoring that would affect the location of a violating $PM_{2.5}$ monitor. It should be noted that there are no $PM_{2.5}$ monitors in West Virginia that currently violate either the 24-hour or annual National Ambient Air Quality Standard. Except for circumstances not anticipated during this review period, such as inadequate federal or state funding, leasing issues, site maintenance issues, personnel resource issues or equipment failures no other *intentional* changes are expected to be made to the $PM_{2.5}$ FRM monitoring network or the criteria pollutant monitoring network/stations during the next 12 months except those discussed within this document. All monitoring sites are leased and those leases are subject to periodic renewals which can affect the DAQ's ability to retain a monitoring site location. The proposed changes are listed in the specific air monitoring site section.

In the pages that follow, each individual monitoring site and corresponding photograph, is listed by county along with the Air Quality Subsystem (AQS) site ID number, site location information, the Metropolitan Statistical Area (MSA) that is represented by the site, a statement as to whether it meets the requirements of Part 58, sampling and analytical method for each parameter, proposed site changes, and any other general comments regarding the site. Other pertinent information such as latitude/longitude, site purpose, the monitor's objective/site type and representative scale is also listed for each site.

Background

On October 17, 2006, the US Environmental Protection Agency (EPA) published final amendments to 40 CFR Part 53 and 58 "Revisions to Ambient Air Monitoring Regulations; Final Rule". This rule became effective on December 18, 2006.

Under Part 58, Subpart B-Monitoring Network, § 58.10 Annual Monitoring Network Plan and Periodic Assessments (a)(1): " Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA."

On March 28, 2016 (effective April 27, 2016) EPA finalized revisions to 40CFR Part 58 "Revision to Ambient Monitoring Quality Assurance and Other Requirements; Final Rule".

Under Part 58 §58.10 (a)(1) "Annual monitoring network plan and periodic network assessment" EPA amended the 2006 language to clarify the handling of any public comment received on the plan: "The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA *and the submitted plan shall include and address, as appropriate, any received comments* (emphasis added).

To review the September 2006 and April 2016 Monitoring Regulations please visit https://www.epa.gov/amtic/monitoring-regulations.

Additional information and to view data publicly available from the AQS data system can be found at www.epa.gov/airdata/ . A copy of the latest DAQ annual air monitoring report can be found at www.dep.wv.gov/daq/air-monitoring/.

SO_2 Data Requirement Rule (DRR)

On August 10, 2015, EPA finalized requirements for air agencies to monitor or model ambient sulfur dioxide (SO_2) levels in areas with large sources of SO_2 emissions to help implement the 1-hour SO_2 National Air Ambient Quality Standard (NAAQS). The rule establishes that, at a minimum, air agencies must characterize air quality around sources that emit 2,000 tons per year (tpy) or more of actual SO_2 emissions. An air agency may avoid the requirement for air quality characterization near a source by adopting enforceable emission limits that ensure that the source will not emit more than 2,000 tpy maximum potential to emit of SO_2. The rule requires agencies to use either modeling of actual source emissions or appropriately sited ambient air quality monitors to assess local SO_2 concentrations.

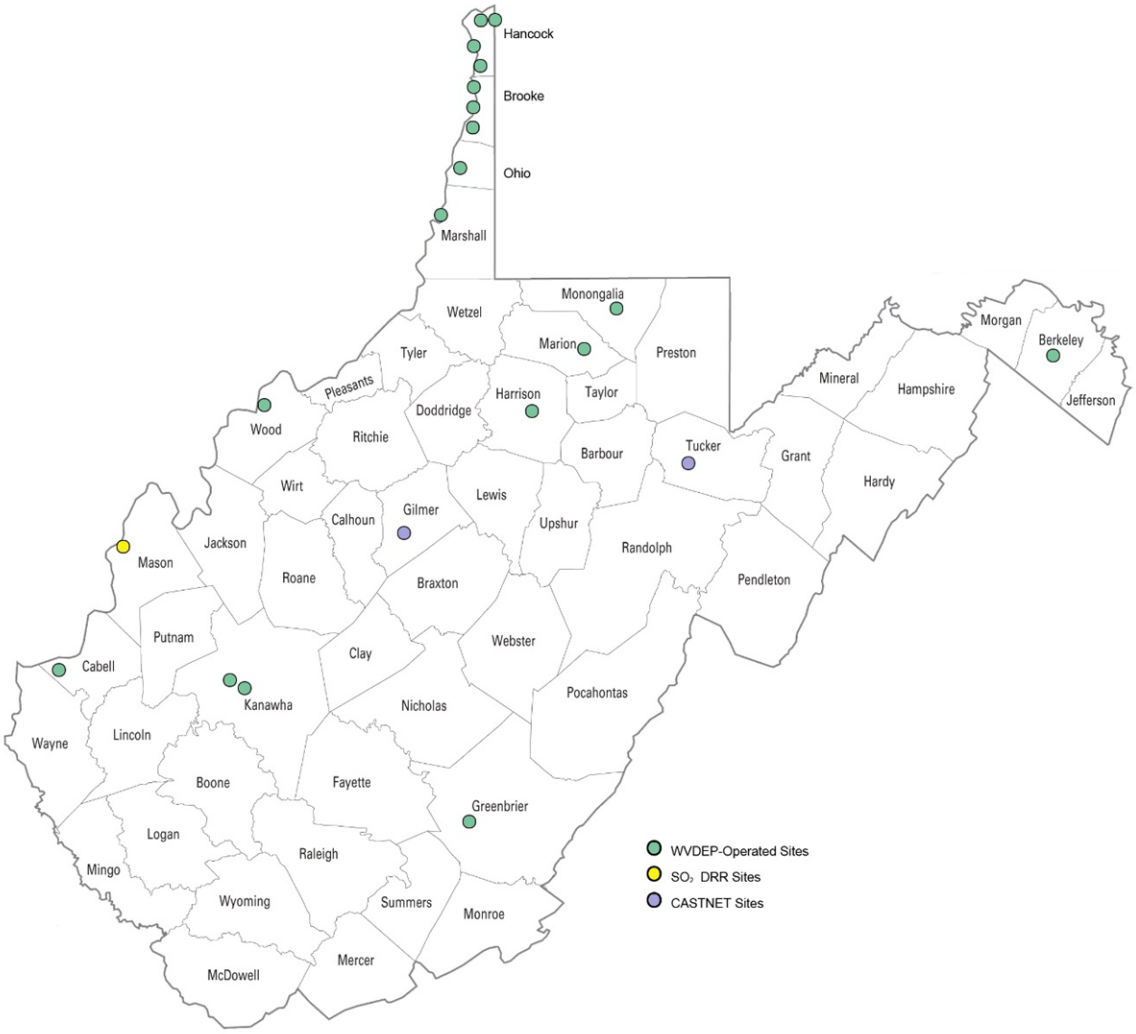
As stated in previous ANPs, there are no West Virginia sources subject to the DRR rule that have elected to conduct ambient air monitoring for SO_2. However, there is currently one DRR site in Mason County, West Virginia, near the Ohio border. There are two SO_2 DRR sources in Ohio: American Electric Power's James M. Gavin and the Ohio Valley Electric Corporation Kyger Creek power plants. Both facilities are electric generating utilities that are located within two miles of each other along the Ohio River in Gallia County. These facilities began conducting SO_2 air monitoring under the SO_2 DRR beginning in 2017 and one of those monitoring sites is in Lakin, West Virginia. The Ohio Environmental Protection Agency (OEPA) is the Primary Quality Assurance Organization (PQAO). DAQ is not responsible for the operation, maintenance, data collection, reporting or quality assurance activities at this site. Additional details may be found in the specific West Virginia counties sections of this report.

Appendix A to this document provides DAQ's SO_2 DRR Annual Report, including an emissions assessment, pursuant to the requirements of 40 CFR 51, Subpart BB, at §51.1205(b).

Overview

This ANP covers operations during 2021 as well as proposed changes for 2022. The map below shows all known air quality monitoring sites in West Virginia using FRM/FEM monitors. DAQ has 18 sites across the state, and operates 17 sites currently. Though shown on the map, DAQ is neither the operator nor the Primary Quality Assurance Organization for the one (1) SO_2 DRR monitoring site or for the two (2) CASTNET sites.

Air Monitoring Sites in West Virginia



The table below provides summary information on all of DAQ's air monitoring sites. DAQ has 18 sites across the state, and operates 17 sites currently.

West Virginia Division of Air Quality - Monitoring Network

As of 4/29/2022

		Pollutants Monitored												
County/Location	**AQS ID**	**AIR TOXICS**	**PM10-2.5**	**PM10 T640X**	**PM2.5 FRM**	**PM2.5 Cont.**	**PM2.5 SPEC**	**CO**	**SO2**	**O3**	**NOx**	**MET**	**AQS Latitude**	**AQS Longitude**
Berkeley														
Martinsburg/Ball Field (MT)	540030003				X					X			39.448001	-77.964130
Brooke														
Follansbee/Mahan Lane (F1)	540090005				X				X				40.340933	-80.596533
McKims Ridge (W7)	540090007								X				40.389660	-80.586240
Weirton/Marland Heights (W5)	540090011			X	X				X				40.394583	-80.612017
Cabell														
Huntington/Prindle Field (H3)	540110007				X					X			38.410242	-82.432436
Greenbrier														
Sam Black Church/DOH Garage (SB)	540250003									X			37.908533	-80.632633
Hancock														
Chester (CH) *	540290008												40.615720	-80.560000
New Cumberland/Tunanidas (W2)	540290007								X				40.460138	-80.576567
Weirton/Summit Circle (W3)	540290009			X	X				X	X			40.427372	-80.592318
Lawrenceville (LV)	540290015								X				40.618353	-80.540618
Harrison														
Clarksburg/Washington Irving JHS (CL)	540330003				X								39.278117	-80.342250
Kanawha														
Charleston Ncore (C6)	540390020	X	X		X	X	X	X	X	X	X	X	38.346258	-81.621161
South Charleston Library (SC)	540391005				X								38.366183	-81.693727
Marion														
Fairmont/Marion Health Care Hosp (FT)	540490006				X								39.481483	-80.134667
Marshall														
Moundsville/Nat'l Guard Armory (MV)	540511002				X	X	X		X				39.915961	-80.733858
Monongalia														
Morgantown Airport (MA)	540610003				X				X	X			39.649367	-79.920897
Ohio														
Warwood (WD)	540690010	X			X					X			40.114760	-80.700972
Wood														
Vienna/Neale School (V1)	541071002				X				X	X			39.323553	-81.552367
Total Sites	**18**	**2**	**1**	**2**	**13**	**2**	**2**	**1**	**10**	**8**	**1**	**1**		

** PM10-2.5 = Manual 3 day sampler (Charleston NCore)

** T640X = Continuous Particulate samplers

** PM2.5 = Manual 3 day samplers

** FRM = Federal Reference Method

** SPEC = Speciated

** MET = Meteorology

* Chester - Not in Operation

Berkeley County

Site: Martinsburg Ball Field
Location: Martinsburg Ball Field, Charlotte Prather Park, Martinsburg, Berkeley County, WV 25401
AQS ID: 54-003-0003
MSA: Hagerstown-Martinsburg, MD-WV
Latitude: 39.448001
Longitude: -77.96413

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Current site established in 1999 to provide air quality monitoring in Berkeley County and the Eastern Panhandle of WV.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted: 4/14/2021 and 10/20/2021
EPA performance evaluation audit conducted 11/30/2021

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/10/2021

Brooke County

Site: Mahan Lane
Location: Mahan Lane, Follansbee, Brooke County, WV 26037
AQS ID: 54-009-0005
MSA: Steubenville-Weirton OH-WV
Latitude: 40.340933
Longitude: -80.596533

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. The site was established in 1983 to provide air quality monitoring in an industrialized area of Brooke County. DAQ had some historical leasing issues with this site and currently operates without a lease in place. This site underwent an extensive upgrade in 2019.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State audit conducted 4/8/2021 and 10/20/2021
EPA performance evaluation audit conducted 8/11/2021

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 8/19/2021
EPA through the probe audit conducted 4/28/2021

Site: McKims Ridge
Location: McKims Ridge Road, Colliers, Brooke County, WV 26035
AQS ID: 54-009-0007
MSA: Steubenville-Weirton OH-WV
Latitude: 40.38966
Longitude: -80.58624

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1997 as part of a dispersion model evaluation study and to provide additional air quality monitoring in Brooke and Hancock Counties in West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 8/19/2021

Site: Marland Heights
Location: Marland Heights, Weirton, Brooke County, WV 26062
AQS ID: 54-009-0011
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.394583
Longitude: -80.612017

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1992 to provide air quality monitoring in an industrial area of Brooke and Hancock Counties in West Virginia.

Implemented change: The aging Tapered Element Oscillating Micro-Balance (TEOM) Series 1405 continuous PM_{10} monitor was discontinued on 10/6/2021 and replaced with a Teledyne API T640x continuous PM_{10} monitor.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
Teledyne API T640x continuous PM_{10} monitor, Federal Equivalent Method
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State flow rate audit conducted 5/19/2021 and 11/30/2021

$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. A collocated $PM_{2.5}$ monitor samples every 12th day. Samples analyzed by gravimetric analysis.
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State audit conducted 4/8/2021 and 10/20/2021

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 3/11/2021

Cabell County

Site: Huntington/ Prindle Field
Location: 1313 14th Street, Huntington, Cabell County, WV 25701
AQS-ID: 54-011-0007
MSA: Huntington-Ashland, WV-KY-OH Metro Area
Latitude: 38.410242
Longitude: -82.432436

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. This site replaces the Marshall University, Huntington site, and started reporting data in 2019.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. A collocated sequential $PM_{2.5}$ monitor samples every 12th day. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/14/2021 and 10/11/2021
Co-located state audit conducted 4/14/2021 and 10/11/2021
EPA performance evaluation audit conducted 12/15/2021

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 7/12/2021

Greenbrier County

Site: Sam Black Church
Location: 235 Gray Gables Rd, Crawley, Department of Highway Garage, Greenbrier County, WV 24913
AQS ID: 54-025-0003
MSA: NA
Latitude: 37.908533
Longitude: -80.632633

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Current site established in 1999 to continue historical background ozone air quality monitoring that started in 1984 in Greenbrier County, a rural area of West Virginia. A new shelter was installed, along with upgraded power in early 2019.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 4/12/2021

Hancock County

Site: New Cumberland
Location: RD#1 Carothers Road, New Cumberland, Hancock County, WV 26047
AQS ID: 54-029-0007
MSA: Steubenville-Weirton, OH-WV
Latitude 40.460138
Longitude -80.576567

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1990 as part of a multi-state SO_2 study (PA-WV-OH) and to provide air quality monitoring in Hancock County, WV.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 3/10/2021

Site: Chester
Location: A.T. Allison Elementary School, 647 Railroad Street, Chester, Hancock County, WV 26034
AQS ID: 54-029-0008
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.615720
Longitude: -80.560000

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. The site at Chester was established on 5/15/1991 to provide air quality monitoring in northern Hancock County, WV. The last data reported to AQS was the SO_2 hourly and 5-minute data through 12/31/2017.

Discretionary special purpose monitoring for the collection of PM_{10} samples for metals analysis was conducted at this site starting in 2009 (TSP metals, and later PM_{10} metals) to support EPA's multi-state investigation into manganese emissions from SH Bell in Liverpool, OH. After a period of overlap, monitoring was switched from TSP metals to PM10 metals monitoring in 2016. PM_{10} samples were collected over a 24-hour period on a once every 6-day schedule.

This discretionary PM_{10} metals toxics site operated throughout 2019, and discontinued operations at the end of the first quarter of 2020. No pollutants are currently monitored at this site.

Site: Summit Circle

Location: Summit Circle, Weirton, Hancock County, WV 26062
AQS ID: 54-029-0009
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.427372
Longitude: -80.592318

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1992 provide air quality monitoring in an industrial area of Hancock County, West Virginia.

As part of an extensive upgrade to this the site, including electrical lines, fencing and decking, and a new shelter, operations were suspended in September 2019, and resumed by early-mid 2020.

Implemented change: The aging Tapered Element Oscillating Micro-Balance (TEOM) Series 1400AB/1400a continuous PM_{10} monitor was discontinued on 8/11/2021 and replaced with a Teledyne API T640x continuous PM_{10} monitor.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
Teledyne API T640x continuous PM_{10} monitor, Federal Equivalent Method
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 5/19/2021 and 11/30/2021

$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 4/8/2021 and 10/20/2021

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/2/2021
EPA through the probe audit conducted 8/11/2021

Ozone – UV absorption continuous gas monitor operated during ozone season Mar – Oct
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/2/2021
EPA through the probe audit conducted 8/11/2021

Site: Lawrenceville
Location: Lawrenceville Park and Tyrone Road, Lawrenceville, Hancock County, WV 26034
AQS ID: 54-029-0015
MSA: Steubenville-Weirton, OH-WV
Latitude: 40.618353
Longitude: -80.540618

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1995 in response to the 1992 installation of Waste Technology Industries (WTI), now known as Heritage Thermal Services, and to provide air monitoring in upper Hancock County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 12/20/2021
EPA through the probe audit conducted 4/29/2021

Harrison County

Site: Clarksburg
Location: Washington Irving Middle School, Clarksburg, Harrison County, WV 26301
AQS ID: 54-033-0003
MSA: NA
Latitude: 39.278117
Longitude: -80.342250

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1997 to monitor $PM_{2.5}$ in Harrison County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential Lo-Volume sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/15/2021 and 10/21/2021
EPA performance evaluation audit conducted 11/3/2021

Kanawha County

Site: NCore
Location: 1436 Dixie St., Charleston, Kanawha County, WV 25301
AQS ID: 54-039-0020
MSA: Charleston, WV
Latitude: 38.346258
Longitude: -81.621161

Comment: Site complies with Appendix A, C, D, E of Part 58. Site required to be established by EPA as part of the national NCore multi-pollutant monitoring network. This site started reporting data in 2016.

Proposed change: As part of this plan, DAQ again requests the special purpose continuous FEM $PM_{2.5}$, BAM, at the NCore site in Charleston be excluded from NAAQS determinations. We will continue to report to AirNow, as required for NCore sites; however, EPA's own comparison tool indicates that the data should not be used to replace or fill-in for FRM data. An annotated print-out of the results from EPA's FRM-FEM $PM_{2.5}$ Continuous Monitor Compatibility Assessment Tool for 2019-2021 data can be found in Appendix B. While dropping 2018 has improved the comparison, the continuous data continues to read higher than the Federal Reference Method (FRM).

Parameters monitored, sampling method, scale, and purpose:

Particulates:
Met One BAM 1020 continuous $PM_{2.5}$ monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/20/2021 and 10/20/2021

$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/15/2021 and 10/14/2021

PM_{10} sequential sampler, Federal Reference Method, samples once every three days. Samples analyzed by gravimetric analysis. Data is used only to calculate and report PM Coarse which equals PM_{10} minus $PM_{2.5}$.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented

Gaseous:
Sulfur Dioxide – UV fluorescent continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 6/15/2021

Ozone – UV absorption continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 9/22/2021

NO/NO_y – Chemiluminescence continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 12/20/2021

Carbon Monoxide –Gas filter correlation continuous trace gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 2/9/2021

$PM_{2.5}$ Speciation
Speciation Trends Network (STN) site equipped with Met One Super SASS and URG 3000N Carbon sampler. Both sample on a once every three-day schedule.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State flow rate audit conducted 1/26/2021, 4/27/2021, 7/22/2021 and 10/20/2021

Toxics
TSP metals, certain Volatile Organic Compounds, and Carbonyls
Representative siting scale: Neighborhood
Samples once every 12 days
Monitoring objective/site type: Population oriented

Other
Ultra-Sonic wind sensor
Temperature
Barometric Pressure
Relative Humidity

Site: South Charleston
Location: South Charleston Public Library 312 4th Ave., South Charleston, Kanawha County, WV 25303
AQS ID: 54-039-1005
MSA: Charleston, WV
Latitude: 38.366183
Longitude: -81.69372717

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1974 to provide air quality monitoring in Kanawha County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates
$PM_{2.5}$ sequential Low-Volume sampler, Federal Reference Method. Samples once every three days. Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/15/2021 and 10/11/2021
EPA performance evaluation audit conducted 12/15/2021

Marion County

Site: Fairmont
Location: 401 Guffey Street, Manchin Health Care Center, Fairmont, Marion County, WV 26554
AQS ID: 54-049-0006
MSA: NA
Latitude: 39.481483
Longitude: -80.134667

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 2000 to monitor $PM_{2.5}$ in Marion County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/15/2021 and 10/21/2021

Marshall County

Site: Moundsville
Location: Moundsville National Guard Armory, Moundsville, Marshall County, WV 26041
AQS ID: 54-051-1002
MSA: Wheeling, WV-OH
Latitude: 39.915961
Longitude: -80.733858

Comment: Site complies with Appendix A, C, D, E of Part. This site is suitable for NAAQS comparisons except for the $PM_{2.5}$ continuous special purpose monitor. Site established in 1983 to provide air quality monitoring in Marshall County, West Virginia.

Implemented change: A continuous $PM_{2.5}$ T640x monitor was installed in 2019; DAQ began reporting quality-assured data from January 1, 2021 to AQS; DAQ began reporting daily to AIRNow on April 21, 2021. This remains a special purpose continuous FEM $PM_{2.5}$ monitor, and data is to be excluded from NAAQS determinations, since two complete years of data are not yet available.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method. Samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/8/2021 and 10/20/2021
EPA performance evaluation audit conducted 11/6/2021

$PM_{2.5}$ Teledyne API T640X continuous $PM_{2.5}$ monitor, Federal Equivalent Method.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 5/6/2021 and 11/30/2021

$PM_{2.5}$ Speciation
Chemical Speciation Network site. Met One Super SASS and URG 3000N Carbon sampler. Both sample on a once every six-day schedule
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State flow rate audit conducted 2/24/2021, 5/21/2021, 8/4/2021 and 10/28/2021

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 12/20/2021
EPA through the probe audit conducted 11/9/2021

Mason County

Site: Lakin
Location: HWY 62, Lakin, WV
AQS ID: 54-053-0001
CBSA: Point Pleasant WV-OH
Latitude: 38.956476
Longitude: -82.088693

Comment: American Electric Powers' (AEP) James M. Gavin and Ohio Valley Electrical Corporation (OVEC) Kyger Creek electric generating facilities located in Gallia County, Ohio have elected to conduct air monitoring under the SO_2 Data Requirements Rule. One of the SO_2 air monitoring sites is in Lakin, Mason County, West Virginia and is included herein for reference. The site is operated by Shell Engineering on behalf of AEP and OVEC. The Ohio Environmental Protection Agency is the responsible Primary Quality Assurance Organization. The DAQ does not have any role in the operation, data reporting, or quality assurance of this site.

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Neighborhood
Monitoring objective/site type: Source-oriented

Monongalia County

Site: Morgantown
Location: Morgantown Municipal Airport, Morgantown, Monongalia County, WV 26505
AQS ID: 54-061-0003
MSA: NA
Latitude: 39.649367
Longitude: -79.920897

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1983 to provide air quality monitoring in Monongalia County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method. Samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/15/2021 and 10/21/2021
EPA performance evaluation audit conducted 11/6/2021

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 7/14/2021

Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 6/8/2021

Ohio County

Site: Warwood/Wheeling
Location: Warwood Water Treatment Plant, Wheeling, Ohio County, WV 26003
AQS ID: 54-069-0010
MSA: Wheeling, WV-OH
Latitude: 40.11476
Longitude: -80.700972

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Current site established in 2005 to continue to provide air quality monitoring in Ohio County, West Virginia.

Implemented change: Toxics metals sampling frequency changed from once every 6 days to once every 12 days in April 2022.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method, samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/8/2021 and 10/20/2021
EPA performance evaluation audit conducted 8/11/2021

Gaseous:
Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 8/5/2021

Toxics
TSP metals, certain Volatile Organic Compounds, and Carbonyls.
Representative siting scale: Neighborhood
Samples once every 12 days
Monitoring objective/site type: Population oriented

Wood County

Site: Vienna
Location: Neale Elementary School, Vienna, Wood County, WV 26105
AQS ID: 54-107-1002
MSA: Parkersburg-Marietta, WV-OH
Latitude: 39.323553
Longitude: -81.552367

Comment: Site complies with Appendix A, C, D, E of Part 58. This site is suitable for NAAQS comparisons. Site established in 1975 to provide air quality monitoring in Wood County, West Virginia.

Parameters monitored, sampling method, scale, and purpose:

Particulates:
$PM_{2.5}$ sequential sampler, Federal Reference Method. Samples once every three days.
Samples analyzed by gravimetric analysis.
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State audit conducted 4/14/2021 and 10/12/2021
EPA performance evaluation audit conducted 11/3/2021

Gaseous:
Sulfur Dioxide – UV fluorescent continuous gas monitor
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 4/19/2021
EPA through the probe audit conducted 11/3/2021

Ozone – UV absorption continuous gas monitor operated during ozone season March – October
Representative siting scale: Urban
Monitoring objective/site type: Population oriented
State accuracy audit conducted 7/27/2021
EPA through the probe audit conducted 11/3/2021

Appendix A - SO_2 Data Requirement Rule Annual Report

Introduction

On August 21, 2015, the U.S. Environmental Protection Agency (EPA) published the *Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS)* (80 FR 51051). This rule, referred to as the Data Requirements Rule (DRR), includes provisions in 40 CFR 51.1205(b) requiring an air agency to submit a report to EPA documenting SO_2 emissions for areas where modeling of actual SO_2 emissions served as the basis for designating the area attainment for the 2010 1-hour SO_2 NAAQS. The report must include an assessment of the cause of any emission increases from the previous year and a recommendation regarding whether additional modeling is needed. These annual reports are due by July 1 after the effective date of an area's initial designation.

Regulatory History

On June 2, 2010, EPA signed a final rule (75 FR 35519) revising the SO_2 NAAQS. EPA established a new 1-hour SO_2 primary NAAQS of 75 parts per billion (ppb), based on the three-year average of the annual 99th percentile of daily 1-hour maximum concentrations. Whenever the EPA revises a NAAQS, the Clean Air Act (CAA) requires EPA to designate areas as "attainment" (meeting), "nonattainment" (not meeting), or "unclassifiable" (insufficient data). Within one year of a NAAQS revision, each state must submit their designation recommendations. The CAA requires EPA to complete the designations process within three years of a NAAQS revision.

On August 5, 2013, EPA published (78 FR 47191), a final rule designating 29 areas, in 16 states, including West Virginia, as nonattainment for the 2010 1-hour SO_2 NAAQS. In that rulemaking, EPA stated they would address the designation of all other areas in separate future actions. At that time, EPA was still developing its strategy for completing the designations process. EPA anticipated using a hybrid approach, allowing the use of either modeling or monitoring data for designations purposes, but EPA anticipated the need to issue additional rulemaking and guidance documents prior to finalizing additional designations. Shortly thereafter, three lawsuits were filed against EPA in different U.S. District Courts, alleging that EPA had failed to perform a nondiscretionary duty under the CAA by not issuing 1-hour SO_2 designations for all portions of the country within three years of NAAQS promulgation. To resolve the legal challenges, a consent decree was entered in federal court on March 2, 2015.

This consent decree established the criteria and deadlines for EPA to complete a second, third, and fourth round of designations for the 2010 1-hour SO_2 NAAQS. The second round mostly affected only those areas that contained a source meeting certain emissions-related criterion established in the consent decree. Such areas were required to be designated no later July 2, 2016. The third round affected all undesignated areas that had not installed and begun operating a new SO_2 monitoring network by January 1, 2017. The deadline for the third round was December 31, 2017. Most areas in the U.S. were designated in this round. In the fourth and final round, the remaining undesignated areas were to be designated by December 31, 2020.

On August 21, 2015, the consent decree was finalized, and EPA published the DRR in 80 FR 51051. The primary purpose of the DRR is to require air agencies to characterize maximum 1-hour SO_2 concentrations around sources emitting 2,000 tons per year (tpy) or more.

Implementation of the DRR requires states to use either modeling or ambient monitoring to assess SO_2 concentrations or to establish federally enforceable emission limits that limit a source's emissions to less than 2,000 tpy.

The initial implementation step of the DRR required states to identify, by January 15, 2016, sources not located in a nonattainment area that had actual annual SO_2 emissions of at least 2,000 tons or were deemed by the air agency as requiring further air quality characterization.

The DRR established January 13, 2017 as the deadline for states to submit the results of those sources modeled. This date also served as the compliance deadline for any new federally enforceable emission limits used to satisfy the DRR. While these deadlines, and those associated with the monitoring option, allow the third and fourth rounds of designations to be informed by data that must be submitted pursuant to the DRR, meeting the second round's July 2, 2016, designation deadline required states and EPA to take actions before the DRR was finalized.

Emissions Assessment

Applicable SO_2 emission sources, defined as having actual annual SO_2 emissions of 2,000 tons or more, where modeled by DAQ as the basis for designating the area as attainment with the 2010 1-hour SO_2 NAAQS. The applicable sources modeled were all electrical generating units (EGU). Because emissions were modeled based on actual emissions instead of allowable emissions, §51.1205(b) requires an annual report to be submitted to EPA documenting the annual SO_2 emissions from each applicable source and providing an assessment of any emission increases from the previous year. Additionally, §51.1205(b)(1) requires an agency's recommendation regarding whether additional modeling characterizing an area's air quality is needed to determine whether the area meets or does not meet the 2010 1-hr SO_2 NAAQS.

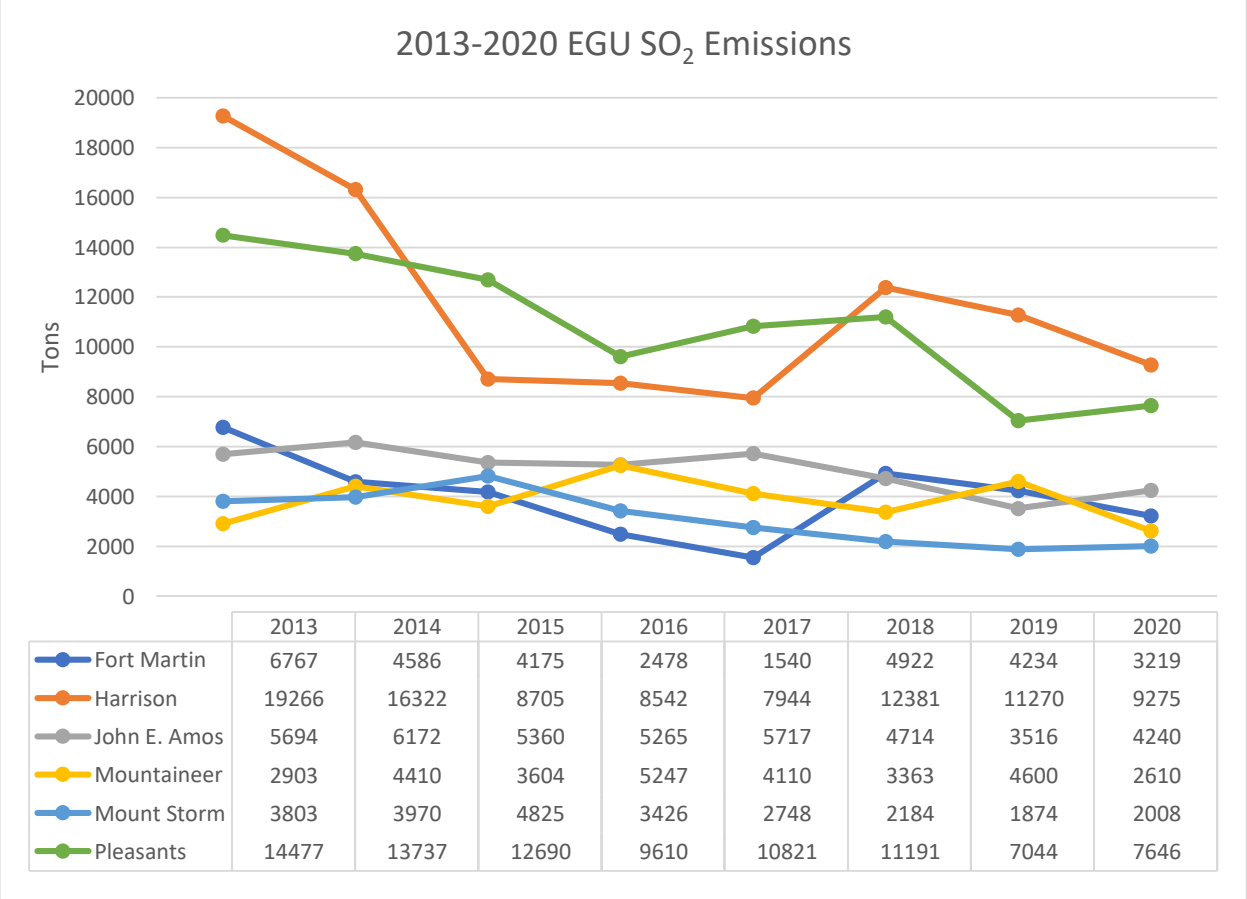
The DRR requires an assessment of SO_2 emissions increases from the previous year. This report includes certified ambient SO_2 air quality monitoring data for 2021, therefore DAQ is assessing actual SO_2 emissions from the previous year, 2020, that may have impacted the 2021 monitoring data. Assessing only the SO_2 increase from a previous year limits the analysis to a two-year period and does not allow for an accurate assessment to determine the need for additional modeling. A comparison of actual annual SO_2 emissions from each applicable source during the initial modeling period, which demonstrated attainment with the 2010 NAAQS, to the previous year actual emissions allows for a better and more meaningful assessment. Therefore, DAQ has made our assessment based the initial modeling years to the previous year. ***Table 1*** below shows each source's three-year initial modeling period and the results of that modeling as a maximum percentage of the 2010 1-hour SO_2 NAAQS.

Table 1: EGU Modeled Year and Percent of NAAQS

EGU Modeled	Years Modeled (actual emissions)	Maximum Percent of NAAQs Modeled
Fort Martin	2013-2015	64%
Harrison	2012-2014	52.8%
John Amos	2013-2015	< 50%
Mountaineer	2012-2014	< 50%
Mount Storm	2013-2015	< 50%
Pleasants Power	2013-2015	77.7%

Figure 1 shows the actual annual SO_2 emissions for each modeled EGU from 2013 through 2020. These emissions were taken from the EPA Clean Air Markets Division (CAMD) database. As the chart illustrates, SO_2 emissions from each EGU has been largely stable or decreasing over the assessment period.

Figure 1: 2013-2020 EGU SO_2 Emissions in tons



	2013	2014	2015	2016	2017	2018	2019	2020
Fort Martin	6767	4586	4175	2478	1540	4922	4234	3219
Harrison	19266	16322	8705	8542	7944	12381	11270	9275
John E. Amos	5694	6172	5360	5265	5717	4714	3516	4240
Mountaineer	2903	4410	3604	5247	4110	3363	4600	2610
Mount Storm	3803	3970	4825	3426	2748	2184	1874	2008
Pleasants	14477	13737	12690	9610	10821	11191	7044	7646

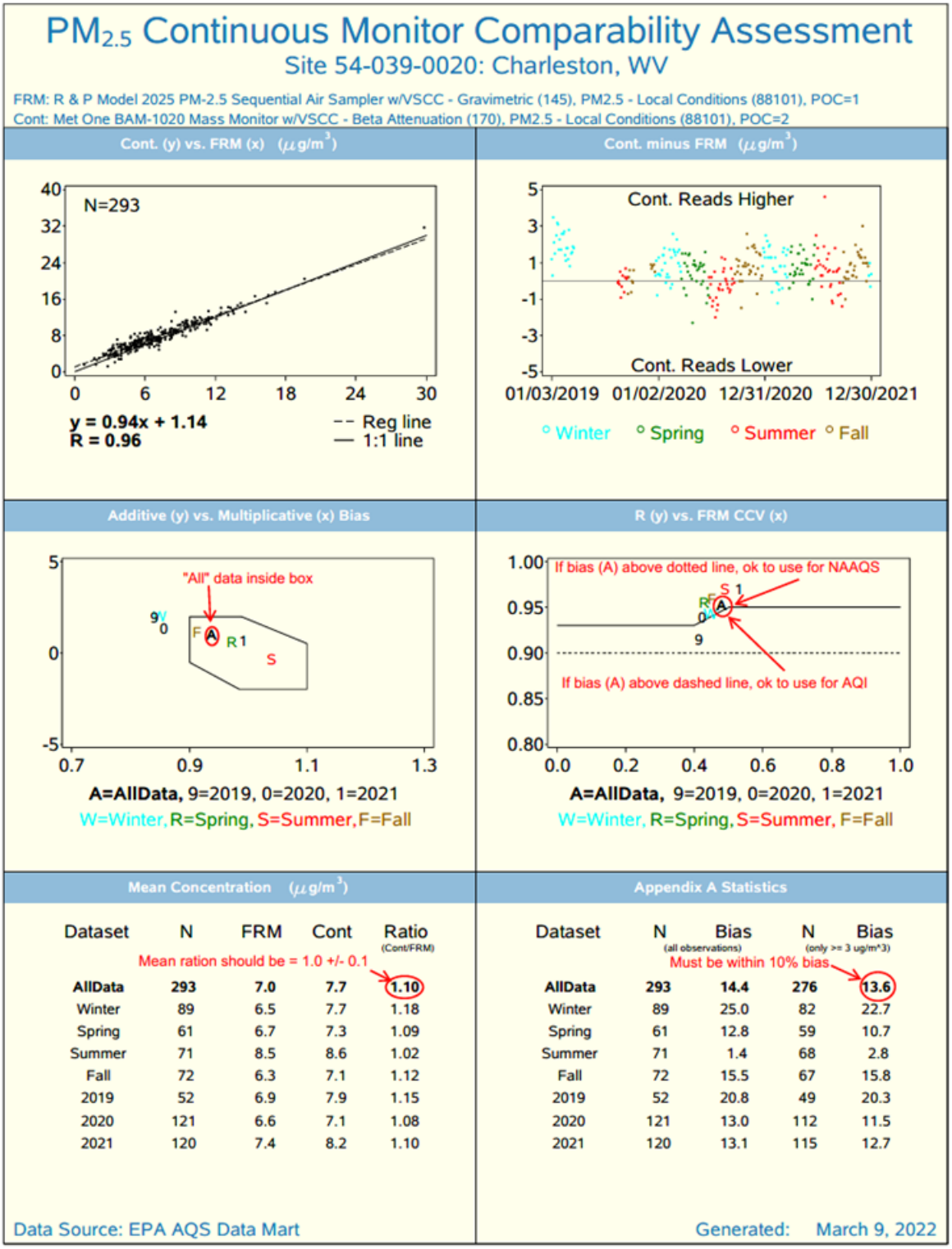
From Figure 1, the source's highest actual SO_2 emissions from the initial three-year modeling period can be compared to the source's actual 2022 emissions. Table 2 shows this comparison and demonstrates that in all cases the 2020 SO_2 emissions were less than the highest modeled year's emissions.

Table 2: Highest Modeled Year SO_2 Emissions vs. 2020 SO_2 Emissions

EGU Modeled	Highest Modeled Year	Highest Modeled Year Emissions (tons)	2020 Emissions (tons)	Change from Highest Modeled Year to 2020 (tons)
Fort Martin	2013	6,767	3,219	-3,548
Harrison	2013	19,266	9,275	-9,991
John Amos	2014	6,172	4,240	-1,932
Mountaineer	2014	4,410	2,610	-1,800
Mount Storm	2015	4,825	2,008	-2,817
Pleasants Power	2013	14,477	7,646	-6,831

As shown in Table 1, emissions initially modeled for each source were substantially less than the SO_2 1-hour NAAQS; with one-half of the sources modeled less than 50 percent of the standard. The emission comparison in Table 2 demonstrates that 2020 actual SO_2 emissions were less than the emissions for the highest modeled year for all EGUs. If the 2021 actual SO_2 emissions were modeled, the results would be less than those modeled during the three-year initial modeling period and less than the maximum percent of the NAAQS shown in Table 1. Three facilities did report minor increases in 2020. However, each of these three facilities are well below the modeled years data and demonstrate an overall downward trend. Therefore, as required in §51.1205(b), and based on this assessment, the air quality areas represented by the modeled sources continue to meet the 2010 1-hour SO_2 NAAQS and DAQ recommends no additional modeling is needed to characterize air quality in these areas.

Appendix B – Charleston NCore FRM-FEM PM2.5 Continuous Monitor Compatibility Assessment Tool for 2019-2021



Dataset	N	FRM	Cont	Ratio (Cont/FRM)
AllData	**293**	**7.0**	**7.7**	**1.10**
Winter	89	6.5	7.7	1.18
Spring	61	6.7	7.3	1.09
Summer	71	8.5	8.6	1.02
Fall	72	6.3	7.1	1.12
2019	52	6.9	7.9	1.15
2020	121	6.6	7.1	1.08
2021	120	7.4	8.2	1.10

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
AllData	**293**	**14.4**	**276**	**13.6**
Winter	89	25.0	82	22.7
Spring	61	12.8	59	10.7
Summer	71	1.4	68	2.8
Fall	72	15.5	67	15.8
2019	52	20.8	49	20.3
2020	121	13.0	112	11.5
2021	120	13.1	115	12.7